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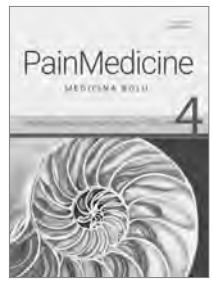

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Assessment of the conformity of analgesics prescribed in postoperative patients: a cross-sectional audit

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Abstract. *An observational cross-sectional study was conducted between November 2018 and September 2019 targeting patients undergoing major surgeries during the aforementioned period. The data were extracted from the medical charts of the patients using a data collection form. The mean age was 49.3 years (SD = 19) with 209 (42.1%) patients aged between 41 and 65 years and only 107 (21.5%) older than 65 years. The majority of the sample had Beirut (39.4%) and Mount Lebanon (49.3%) as governorates of residence. The mean BMI was 24.6 kg/m^2 (SD = 4.81). The length of stay in the hospital varied in the sample where 359 (72.2) patients were hospitalized for one to five days, 92 (18.5%) for six to ten days and 46 (9.3%) for longer than ten days. Almost 90% of the analgesic were conforming in terms of dosage, treatment duration, choice, and contraindication. When assessing paracetamol use, almost 11% of non-conformity was reported for dosage, duration, and contraindication. A lower non-conformity was noted for non-steroidal anti-inflammatory drugs (NSAIDs) (5% for choice and 2% for contraindication). Nevertheless, almost 14% of patients were using tramadol to manage their pain although its contraindication and 9.7% of non-conformity were noted with the duration of treatment with pethidine.*

Key words: *analgetics, pain, non-steroidal anti-inflammatory drugs, patients.*

Introduction

The International Association for the Study of Pain (IASP) describes the pain as an irritating sensory and emotional experience in relationship with actual or potential tissue damage[1]. Several causes and mechanisms can induce pain such as headache and migraine, musculoskeletal pain, and post-surgical pain[1,2]. Nevertheless, the sensation of pain is subjective and is affected by previous pain experiences, cognitive behavior, and biological and social factors[1,3].

More than half of the patients experience pain during their hospitalization with a high rate of uncontrollable pain. This pain can be related to other comorbidities, surgical procedures, catheters, tubes, and sedentism[4]. Following their surgery, patients may experience moderate or severe pain[5]. Post-operative pain (POP) is a major concern for many patients since it can affect their recovery, increase the likelihood of postoperative complications and decrease their quality of life[6]. Moreover, POP can induce

chronic post-surgical pain consequently to peripheral and central sensitization[7]. In most cases, POP affects negatively the health of patients during and after hospitalization and as a result, diminishes their productivity. The aforementioned pain could aggravate the economic burden of disease, cause temporal or long-term disabilities, deficiency in the workplace, and diminished work capacity[8]. Additionally, POP is associated with depression and poor sleep quality affecting 22.9 % to 60.8 % of the patients[4,9].

In clinical practice, post-operative patients often refuse to take analgesics prescribed based on guidelines for pain management. This behavior is mostly caused by their lack of knowledge, concerns about their side effects and fear of addiction[10]. However, health professionals play an important role in pain assessment and recovery by the guidelines of POP management[11]. Several pharmacological regimens including analgesics or local anesthetics can be administered taking into account the dosage and choice with minimal adverse events. Prescribed analgesics in POP include Paracetamol, non-steroidal anti-inflammatory drugs and opioids such as tramadol, morphine and Pethidine[12].

Nonetheless, non-conformity to guidelines in POP management can generate clinical and psychological adverse events[6]. It has been reported that 29 % of hospitalized patients experienced moderate to severe pain during rest and 41 % during activity[13]. The lack of proper pain management may lead to the persistence of the pain after discharge[7]. It can also oblige patients to seek medical treatment repeatedly, which can indirectly increase overall health costs and compliance[13]. Therefore, this study aims to: (i) assess the relationship between conformity to guidelines and general and medical history, (ii) assess analgesic prescription conformity in POP, and (iii) evaluate the predictors of non-conformity to guidelines of analgesics in POP management.

Methods

Study design

An observational cross-sectional study was conducted between November 2018 and September 2019 targeting patients undergoing major surgeries during the aforementioned period. The data were extracted from the medical charts of the patients using a data collection form.

Study population

A list of all the patients admitted to undertaking a surgical procedure in the hospital between the first of November 2018 and June 2019 was obtained from the hospital database. Afterward, patients were included in the study based on predefined criteria. The main inclusion criteria were adult Lebanese patients undergoing major surgery. Those on hemodialysis or who died during surgery were excluded from the study. Out of the 1024 patients, only 497 (48.53 %) patients were included in the study (Figure 1).

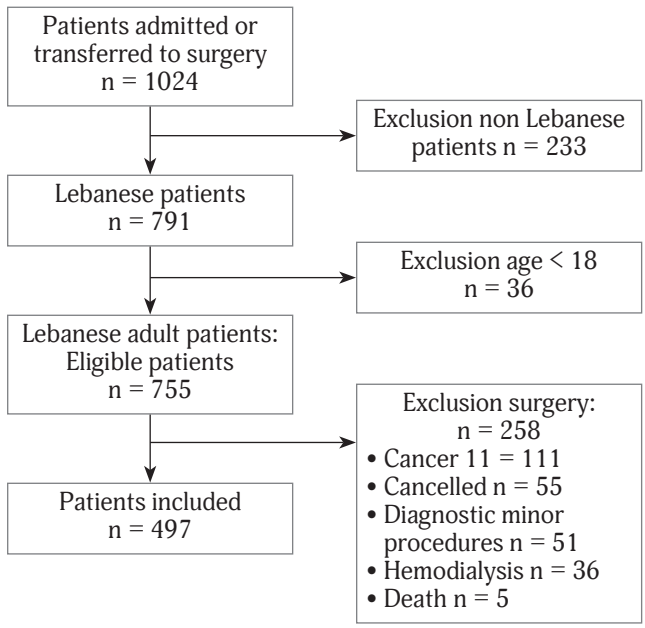

Fig. 1. Flow chart of the study sample selection

Sample size

The sample size estimation was performed using Epi-info software. Consequently, a minimum sample of 385 was required based on the following formula:

$$N = \frac{(Z_{1-a/2})^2\, p\,(1-p)}{d^2}$$

where Z is the standard normal value at a 95 % Confidence Interval, P is the expected proportion of outcome in the population based on previous studies set at 0.5 and d represents the absolute precision (5 % marginal error). Nonetheless, all the patients satisfying the previously defined criteria were included in the study leading to a total number of 497 patients.

Data collection

The data was collected using a uniform data collection form. The aforementioned form included general characteristics of the patients (age, sex, height, weight, residence, smoking and alcohol consumption habits). Moreover, the information regarding the medical and medication history in addition to laboratory analysis results was provided from the patient's medical charts. Another part collected the characteristics of the surgical intervention, perioperative and postoperative analgesics use as well as

discharge medication. The length of stay was calculated using the date of admission and the date of discharge.

The body mass index (BMI) was calculated using the formula BMI (kg/m^2) = weight (kg) / [Height (m)]^2. Smoking status was categorized into three categories: smoker (at least 100 cigarettes in his lifetime), non-smoker (never or less than 100 cigarettes) and ex-smoker (previously smoked and stopped). Renal function was assessed based on Creatinine Clearance (CrCl) which was calculated using the Cockcroft – Gault formula:

$$Creatinine\ Clearance_{(Men)} = \frac{(140 - age) \times weight\ (kg)}{SCr \times 72}$$

$$Creatinine\ Clearance_{(Women)} = \frac{[0.85\ (140 - age) \times weight\ (kg)]}{SCr \times 72}$$

Creatinine Clearance is in mL/min, age is in years, weight is in kg and SCr is in mg/dL.

Afterwards, the variable "renal function" was categorized into: Normal (CrCl > 60 mL/min), mild (CrCl 45–59 mL/min), moderate (CrCl 30–44 mL/min) and severe (CrCl 15–29 mL/min).

Conformity assessment

POP management was assessed using the "Guidelines on the Management of Postoperative Pain 2016" by the American Pain Society[14], the WHO analgesic ladder[15], Kidney disease improving global outcomes (KDIGO)[16], Medscape and a scientific paper about POP management in patients with CKD[17]. For each patient, four criteria were used to determine the conformity or non-conformity:

1. Choice – conformity of the type of analgesia based on the severity of the pain.
2. Dose – conformity and checking for dose adjustment.
3. Duration – total duration of use.
4. Contraindication and Interaction (using Medscape's drug interaction checker).

Ethical considerations

The study protocol and the form used for data collection were approved by the ethical committee institutional review board of the hospital. The protocol, data collection form and the publication of the results were сомnsidered for research purposes only. Anonymity and confidentiality were preserved since no name or personal data had been collected. Given that the data were collected after the discharge of the patients, this study was framed as a clinical audit and therefore no informed consent was required for this part of the study.

Statistical analysis

The statistical analyses were performed using Statistical Package for Social Sciences (SPSS Inc, Chicago, Illinois) Version 26. The Continuous variables are presented using means and standard deviations, whilst categorical variables are presented using frequencies and percentages. For the conformity assessment, a bivariate analysis was conducted in which the dependent variable was total conformity of postoperative analgesia (dichotomous). The chi-square / Fisher exact test was used to compare percentages between associate categorical variables. The unpaired Student t-test / Mann – Whitney test was used for the comparison of data between two different groups. P-value < 0.05 was considered statistically significant.

Univariable relationships between two categorical variables or an independent continuous variable and a categorical dependent variable were assessed using logistic regression, producing crude ORs with 95 % CI. The answers to the questions regarding the characteristics of the operation and the general demographics were used as independent variables in a multivariate logistic regression that used conformity to guidelines for post-operative analgesic use as the dependent variable. The variables age and sex were always included in the regression irrespective of statistical significance since these variables have previously been shown to be clinically important variables to adjust for. The other variables were only selected if they had P-values < 0.20 in univariable analysis. Whether or not a variable was added to the model was based on the likelihood ratio test with significance set at $p < 0.05$.

Results

General characteristics of the patients

Table 1 represents the general characteristics of the study participants. The sample consisted of 57.5 % (n = 286) men and 42.5 % (n = 211) women, all alive at discharge. The mean age was 49.3 years (SD = 19) with 209 (42.1 %) patients aged between 41 and 65 years and only 107 (21.5 %) older than 65 years. The majority of the sample had Beirut (39.4 %) and Mount Lebanon (49.3 %) as governorates of residence. The mean BMI was 24.6 Kg/m^2 (SD = 4.81). The length of stay in the hospital varied in the sample where 359 (72.2) patients were hospitalized for one to five days, 92 (18.5 %) for six to ten days and 46 (9.3 %) for longer than ten days. Moreover, almost half of the patients were actual smokers (50.7 %) versus 44.5 % non-smokers and 4.8 % ex-smokers and only 31 (6.2 %) were alcohol consumers.

Table 1. Distribution of the general characteristics of the patients

		Frequency (%)
Sex (N = 497)	Man	286 (57.5%)
	Woman	211 (42.5%)
Age (years) (N = 497)	Mean ± SD	49.3 ± 19
	18–40	181 (36.4%)
	41–65	209 (42.1%)
	More than 65	107 (21.5%)
Governorate of residence (N = 497)	Beirut	196 (39.4%)
	Mount Lebanon	245 (49.3%)
	North	12 (2.4%)
	South	26 (5.2%)
	Bekaa	18 (3.6%)
Weight (N = 497)	Mean ± SD	70.4 ± 14.1
BMI (N = 497)	Mean ± SD	24.6 ± 4.8
	Less than 18.5	4 (0.8%)
	18.5–24.9	354 (71.2%)
	25–29.9	81 (16.3%)
	More than 30	58 (11.7%)
Length of stay (days) (N = 497)	Mean ± SD	4.9 ± 4.5
	1–5	359 (72.2%)
	6–10	92 (18.5%)
	More than 10	46 (9.3%)
Smoking status (N = 497)	Smoker	252 (50.7%)
	Non-smoker	221 (44.5%)
	Ex-smoker	24 (4.8%)
Alcohol consumption (N = 497)		31 (6.2%)
Type of anesthesia during the surgery (N = 497)	General	275 (55.3%)
	Local	41 (8.2%)
	Spinal	108 (21.7%)
	Combined	73 (14.7%)

Results are given in terms of frequency (percentage); BMI: Body mass index.

Figure 2 illustrates the distribution of the pain intensity between the patients. In total, only 50 patients did not experience pain after their surgeries while a higher percentage was reported for those experiencing mild and moderate pain intensity (34.4% and 45.3% respectively).

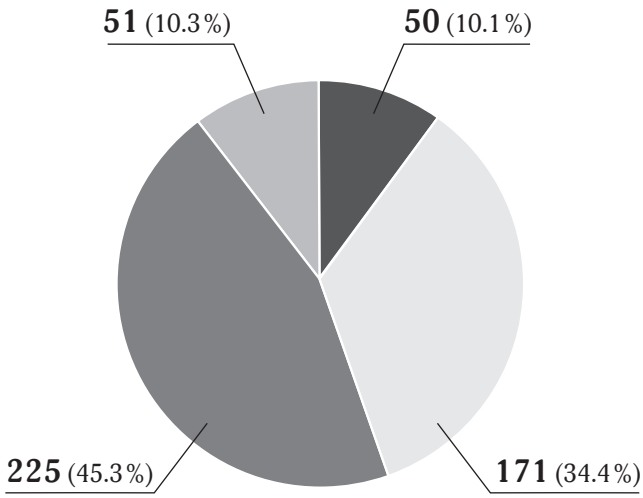

Fig. 2. Distribution of the pain intensity between the patients

Medical and medication history

Table 2 describes the medical and medication history of the patients. In total, 227 (45.7%) patients had a previous medical history. In terms of comorbidities, it was noted that 106 (21.3%) patients suffered from only one medical condition while 48 (9.7%) patients had two comorbidities and 73 (14.7%) with more than two. Furthermore, 435 (87.5%) patients had a normal renal function (CrCl ≥ 60 mL/min), 32 (6.4%) had a mild Chronic kidney disease (CKD) (CrCl = 45–59 mL/min), 20 (4%) had a moderate CKD (CrCl = 30–44 mL/min) and 10 (2%) had a severe CKD (CrCl = 15–29 mL/min). Additionally, 131 (26.4%) were hypertensive, 77 (15.5%) were diabetics and 107 (21.5%) had anemia. On the other side, 220 (44.3%) used medication at home of which 66 (30%) used statins, 143 (65%) antihypertensive medication and 81 (36.8%) used

Table 2. Description of the medical and medication history of the patients

	Frequency (%)
Medical history (N = 497)	227 (45.7%)
Comorbidities (N = 497)	
None	270 (54.3%)
One	106 (21.3%)
Two	73 (14.7%)
More than two	48 (9.7%)
Renal function (N = 497)	
Normal	435 (87.5%)
Chronic kidney disease mild	32 (6.4%)
Chronic kidney disease moderate	20 (4%)
Chronic kidney disease severe	10 (2%)
Coronary artery disease (N = 497)	41 (8.2%)
Hypertension (N = 497)	131 (26.4%)
Diabetes mellitus (N = 497)	77 (15.5%)
Anemia (N = 497)	107 (21.5%)
Medication history (N = 497)	220 (44.3%)
Statins (N = 220)	66 (30%)
Benzodiazepine (N = 220)	15 (6.8%)
Antihypertensive (N = 220)	143 (65%)
Antiplatelet (N = 220)	81 (36.8%)
Anticoagulant (N = 220)	8 (3.7%)
Corticosteroids (N = 220)	12 (5.5%)
Analgesics (in the last 3 months) (N = 497)	60 (12.1%)

Results are given in terms of frequency (percentage).

an antiplatelet. Only 60 patients used analgesics three months before their hospitalization.

Association between conformity to guidelines, general and medical history variables

The bivariate analysis associating the conformity to guidelines with general and medical history variables is presented in Table 3. A statistically significant relationship was noted between age and length of stay where patients older than 65 had a higher degree of non-conformity compared to younger patients ($p < 0.001$) and almost 24% of non-conformity was observed with patients hospitalized for more than ten days ($p = 0.008$). In addition, those with medical and medication history had higher non-conformity ($p = 0.002$ and 0.005 respectively) and patients with severe pain intensity had 39.2% non-conformity compared to only 8.4% for those with moderate pain ($p < 0.001$).

Table 3. Association between conformity to guidelines, general and medical history variables

		Conform	Non-conform	P-value
Sex (N = 497)	Man	258 (90.2%)	28 (9.8%)	0.291
	Woman	184 (87.2%)	27 (12.8%)	
Age (years) (N = 497)	18–40	171 (94.5%)	10 (5.5%)	
	41–65	190 (90.9%)	19 (9.1%)	< 0.001
	More than 65	81 (75.7%)	26 (24.3%)	
BMI (N = 497)	Less than 18.5	4 (100%)	—	0.001
	18.5–24.9	327 (92.4%)	27 (7.6%)	
	25–29.9	66 (81.5%)	15 (18.5%)	
	More than 30	45 (77.6%)	13 (22.4%)	
Length of stay (days) (N = 497)	1–5	327 (91.1%)	32 (8.9%)	
	6–10	80 (87%)	12 (13%)	0.008
	More than 10	35 (76.1%)	11 (23.9%)	
Smoking status (N = 497)	Smoker	193 (87.3%)	28 (12.7%)	
	Non-smoker	229 (90.9%)	23 (9.1%)	0.316
	Ex-smoker	20 (83.3%)	4 (16.7%)	
Alcohol consumption (N = 497)	Yes	28 (90.3%)	3 (9.7%)	0.799
	No	414 (88.8%)	52 (11.2%)	
Medical history (N = 497)	Yes	191 (84.1%)	36 (15.9%)	0.002
	No	251 (93%)	19 (7%)	
Comorbidities (N = 227)	One	95 (89.6%)	11 (10.4)	
	Two	37 (77.1%)	11 (22.9%)	0.092
	More than two	59 (80.8%)	14 (19.2%)	
Medication history (N=497)	Yes	186 (84.5%)	34 (15.5%)	0.005
	No	256 (92.4%)	21 (7.6%)	
Analgesics (in the last 3 months) (N = 497)	Yes	51 (85%)	9 (15%)	0.300
	No	391 (89.5%)	46 (10.5%)	
Type of anesthesia during the surgery (N = 497)	General	247 (89.8%)	28 (10.2%)	0.040
	Local	31 (75.6%)	10 (24.4%)	
	Spinal	97 (89.8%)	11 (10.2%)	
	Combined	67 (91.8%)	6 (8.2%)	

		Conform	Non-conform	P-value
Pain intensity (N = 497)	None to mild	205 (92.8%)	16 (7.2%)	
	Moderate	206 (91.6%)	19 (8.4%)	< 0.001
	Severe	31 (60.8%)	20 (39.2%)	

Results are given in terms of frequency (percentage); BMI: Body mass index.

Assessment of analgesic prescription´s conformity

Table 4 describes the conformity of the different types of analgesics in postoperative pain management. Almost 90% of the analgesic were conforming in terms of dosage, treatment duration, choice, and contraindication. When assessing Paracetamol use, almost 11% of non-conformity was reported for dosage, duration, and contraindication. A lower non-conformity was noted for non-steroidal anti-inflammatory drugs (NSAIDs) (5% for choice and 2% for contraindication). Nevertheless, almost 14% of patients were using tramadol to manage their pain although its contraindication and 9.7% of non-conformity were noted with the duration of treatment with Pethidine.

Correlation between conformity to guidelines and the characteristics of the patients

Table 5 shows that after adjusting for covariates, the odds of non-conformity of the post-operative analgesic treatment were extended per increase of one year in age (OR 1.03, 95% CI 1.01–1.06). Moreover, patients with two comorbidities had 2.55 higher odds of non-conformity of the analgesic treatment compared to those with only one (OR 2.55, 95% CI 0.97–6.71). Finally, a significant correlation

Table 4. Assessment of the conformity of the different analgesics in post-operative patients

		Conform	Non-conform
Paracetamol (N = 489)	Dosage	434 (89.3%)	52 (10.7%)
	Duration	434 (88.9%)	54 (11.1%)
	Choice	434 (90.6%)	45 (9.4%)
	Contraindication	434 (88.9%)	54 (11.1%)
Non-steroidal anti-inflammatory drugs (N = 108)	Dosage	96 (91.4%)	9 (8.6%)
	Duration	96 (90.6%)	10 (9.4%)
	Choice	96 (95%)	5 (5%)
	Contraindication	96 (98%)	2 (2%)
Tramadol (N = 126)	Dosage	107 (89.9%)	12 (10.1%)
	Duration	107 (89.9%)	12 (10.1%)
	Choice	107 (89.2%)	13 (10.8%)
	Contraindication	107 (86.3%)	17 (13.7%)
Morphine (N = 30)	Dosage	25 (89.3%)	3 (10.7%)
	Duration	25 (89.3%)	3 (10.7%)
	Choice	25 (89.3%)	3 (10.7%)
	Contraindication	25 (86.2%)	4 (13.8%)
Pethidine (N = 284)	Dosage	251 (94.4%)	15 (5.6%)
	Duration	251 (90.3%)	27 (9.7%)
	Choice	251 (94.4%)	15 (5.6%)
	Contraindication	251 (93%)	19 (7%)

Results are given in terms of frequency (percentage).

Table 5. Predictors of the odds of non-conformity to analgesic guidelines in post-operative patients

	Unadjusted model		Adjusted model	
	OR [95% CI]	*P-value*	*OR [95% CI]*	*P-value*
Age in years (per increase of one year)	1.04 [1.02–1.05]	< 0.001	1.03 [1.01–1.06]	0.046
Woman (man as reference)	1.35 [0.77–2.37]	0.292	1.12 [0.51–2.49]	0.774
Weight (per increase of one kilogram)	1.03 [1.01–1.05]	0.003	1.02 [0.99–1.05]	0.116
Length of stay (1–5 days as reference)				
6–10 days	1.53 [0.76–3.11]	0.236	—	—
More than 10 days	3.21 [1.49–6.93]	0.003	—	—
Smoking status (smoker as reference)				
Non-smoker	1.44 [0.81–2.59]	0.217	—	—
Ex-smoker	1.99 [0.63–6.33]	0.243	—	—
Type of anesthesia (general as reference)				
Local	2.85 [1.26–6.42]	0.012	—	—
Spinal	1 [0.48–2.09]	0.999	—	—
Combined	0.79 [0.31–1.99]	0.616	—	—
Medical history (No as reference)				
Yes	2.49 [1.39–4.48]	0.002	—	—
Comorbidities (One as reference)				
Two	2.57 [1.02–6.43]	0.044	2.55 [0.97–6.71]	0.056
More than two	2.05 [0.87–4.81]	0.100	1.45 [0.57–3.49]	0.439
Medication history (No as reference)				
Yes	2.23 [1.25–3.96]	0.006	—	—
Pain intensity (None to mild as reference)				
Moderate	1.18 [0.59–2.36]	0.637	1.58 [0.66–3.81]	0.303
Severe	8.26 [3.87–17.64]	< 0.001	6.11 [2.16–17.3]	< 0.001

* Question: Is the post-operative analgesic treatment conform? The baseline answer is "Yes".
* OR: Odds Ratio; CI: Confidence interval.

was noted between having severe pain and non-conformity with 6.11 higher odds compared to the patients with no to mild pain (OR 6.11, 95% CI 2.16–17.3).

Discussion

An overall high degree of accordance with the guidelines was noted in terms of dosage, choice, duration of treatment and contraindication. The distribution of the patients in the study is comparable to the national distribution of the patients undergoing a surgical procedure in 2019 with 52.83% men and 47.17% women.[18] The mean age of the patients was 49.3 ± 19 in other studies involving hospitalized patients.[19, 20] The percentage of smokers in the sample is lower than the findings of a recent study conducted in 2021 targeting the general population in Lebanon (50.7% versus 70.9%).[21] This lower reported percentage could be explained by the fact that hospitalized patients tend to report healthier lifestyle habits or diminish their harmful practices due to their advanced condition.

The majority of the patients (72.2%) were hospitalized for less than five days in agreement with another study evaluating preoperative exposure to narcotics with an average of six days.[22] Furthermore, more than half of the patients had general anesthesia during their surgery which can be elucidated that the study population only included patients undergoing major surgeries. Only 12.1% reported the use of analgesics three months before their operation. The pre-operative pain management and the existence of surgeries not associated with painful conditions could explain this low percentage.[23]

The bivariate analysis highlighted a higher degree of non-conformity for patients older than 65 years ($p < 0.001$) mostly due to their lower compliance and the continual increase in pain prevalence between ages[24, 25]. In addition, it was noted that 24% of the patients who were hospitalized for more than ten days had analgesic treatment non-conformity compared to only 8.9% of those hospitalized for less than five days. This result is coherent with a study assessing postoperative pain in which the length of stay was correlated with increased analgesic consumption[26]. A randomized clinical trial conducted in 2021 described a significant underestimation of the duration of postoperative pain[27]. On the other side, a statistically significant relationship was reported when assessing the conformity to guidelines and the pain intensity where a higher non-conformity was noted for patients with severe pain ($p < 0.001$). Comparably, it was reported that 43% of patients with severe conditions had been prescribed opioid use disorders when seeking treatment in a pain center in France[28].

In addition, when testing the conformity of the use of the different types of analgesics, the literature reported some improper ordering of medication in post-anesthesia care units leading to non-conformity of their administration[29]. This study reported almost 11% non-conformity of Paracetamol use in terms of dosage, duration and contraindication. This result can be related to the systematic use of Paracetamol in hospitals based on its beneficial effect of reducing the pain score of 0.5 in postoperative patients[30]. Nevertheless, when assessing the contraindication of non-steroidal anti-inflammatory drugs, only 2% of non-conformity was noted. A review conducted in 2016 emphasized that NSAIDs increased the satisfaction of patients and decreased the use of opioids without increasing the incidence of adverse events in the postoperative phase[31]. Moreover, almost 14% of non-conformity was reported with contraindication of Tramadol mainly due to the drug-drug interactions with several classes of drugs and the aggravation of the associated side effects[32–34].

When evaluating the predictors of the odds of non-conformity to analgesic guidelines in post-operative patients and after adjusting for covariates, these odds were 3% higher with the increase of one year in age (OR 1.03, 95% CI 1.01–1.06). These findings are in agreement with a systematic review conducted in 2009 where age was a significant predictor of both analgesic consumption and postoperative pain[35]. Additionally, patients with two comorbidities had 2.55 higher odds of non-conformity in comparison with those with only one (OR 2.55, 95% CI 0.97–6.71). These findings could be explained by the fact that other comorbidities such as diabetes and cancer may be associated with pain and therefore may escalate its intensity and as a consequence analgesic consumption[36]. Finally, patients with severe pain had 6.11 higher odds of analgesic treatment non-conformity compared to the patients with no to mild pain (OR 6.11, 95% CI 2.16–17.3). The aforementioned odds may be correlated with the extrapolation of the WHO three-step analgesic ladder to different post-operative patients which may lead to their overuse [37].

This study has several limitations. First, it was limited to only one public hospital and therefore the findings of this study could not be generalized to other public or private hospitals. Furthermore, another limitation is linked to measurement bias since pain is subjective despite the use of scales like NPRS in addition to the information bias because data were collected from medical charts. These limitations were addressed by providing adequate uniform training for the data collectors and the initial definition of the inclusion criteria to minimize selection bias. Moreover, the control for confounders increased the internal validity of the study.

Conclusion

POP remains a prevalent problem as patients still experience moderate to severe pain after surgery. Age, comorbidities and pain intensity were significantly correlated with non-conformity of the analgesic treatment. It is recommended to use multimodal analgesia, which reduces the dose, and side effects of opioids. The pain must be assessed regularly taking into account non-conformity predictors. The perception of patients and pain reporting post-operations should be addressed before the surgeries to maximize their satisfaction and improve their quality of life.

Declarations

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

The Author(s) declare(s) that there is no conflict of interest.

The study protocol and tool were reviewed and approved by the ethical committee of Rafik Hariri University hospital on July 9th, 2019.

Authors contributions:

NB: Data curation, formal analysis, methodology and writing-original draft;

GH: Conceptualization, formal analysis, Validation and Writing-original draft;

LK: Conceptualization, Methodology and Writing-original draft;

DK: Methodology, project administration, writing-original draft;

RA: Methodology, formal analysis, writing-original draft;

SR and SA: Conceptualization, data curation, methodology, Writing-review and editing.

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Оцінка відповідності анальгетиків, призначених у післяопераційних хворих: перехресний аудит

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Анотація. *У період з листопада 2018 року по вересень 2019 року було проведено обсерваційне перехресне дослідження, націлене на пацієнтів, які перенесли серйозні операції протягом вищезгаданого періоду. Дані були отримані з медичних карт пацієнтів за допомогою форми збору даних. Середній вік становив 49,3 року (SD = 19), причому 209 (42,1%) пацієнтів віком від 41 до 65 років і лише 107 (21,5%) старші, ніж 65 років. У більшості вибірки пацієнти проживали у Бейруті (39,4%) і Гірському Лівані (49,3%). Середній ІМТ становив 24,6 кг/м² (SD = 4,81). Тривалість перебування в лікарні була різною у вибірці: 359 (72,2) пацієнтів були госпіталізовані від одного до п'яти днів, 92 (18,5%) — від шести до десяти днів і 46 (9,3%) — довше десяти днів. Майже 90% анальгетиків відповідали за дозуванням, тривалістю лікування, вибором і протипоказаннями. При оцінці використання парацетамолу було повідомлено про майже 11% випадків невідповідності щодо дозування, тривалості та протипоказань. Менша невідповідність була відзначена для нестероїдних протизапальних препаратів (НПЗП) (5% для вибору та 2% для протипоказань). Тим не менш, майже 14% пацієнтів використовували трамадол для купірування болю, хоча його протипоказання та 9,7% невідповідності були відзначені тривалістю лікування петидином.*

Ключові слова: *анальгетики, біль, нестероїдні протизапальні засоби, пацієнти.*